CLAIMS

1. A catalytically active amorphous porous solid, comprising a mixed oxide of silicon, aluminum and phosphorus, characterized by an atomic ratio Si/Al ranging from 10 to 250, a P/Al ratio of at least 0.1, but lower than 5, a total pore volume ranging from 0.5 to 2.0 ml/g, with an average diameter ranging from 3 to 40 nm, and a specific surface area ranging from 200 to 1000 m^2/g.

2. The solid according to claim 1, wherein, in the mixed oxide, said atomic ratio Si/Al ranges from 15 to 200 and said atomic ratio P/Al ranges from 0.3 to 3.5.

3. The solid according to claim 1 or 2, wherein said pore volume ranges from 0.7 to 1.7 ml/g, with an average diameter ranging from 5 to 30 nm, and said surface area ranges from 300 to 900 m^2/g.

4. The solid according to any of the previous claims, wherein the difference between 10% and 90% of the pore dimensions in the distribution curve is within a diameter range of 2 to 40 nm.

5. The solid according to any of the previous claims, comprising at least 95% by weight of said mixed oxide and up to 5% by weight of at least one oxide of a metal selected from Ti, Zr, V, Cr, Fe, Co, Ni, Pt, Pd, Mo, Zn, Ga and Sn.

6. A catalytically active solid composition comprising from 30 to 99% by weight of the amorphous porous solid according to any of the previous claims, and from 70 to 1% by weight of an inert inorganic binder.

7. The composition according to claim 6, comprising from 50 to 80% by weight of said amorphous porous solid and from 50 to 20% by weight of said inert inorganic binder.

8. The composition according to any of the previous claims 6 and 7, wherein said inert binder is selected from silica, alumina, clay, titanium oxide (TiO_2), zirconium oxide (ZrO_2), boron oxide (B_2O_3), or mixtures thereof.

9. The composition according to any of the previous claims from 6 to 8, wherein said inert binder essentially consists of alumina.

10. The composition according to one of the previous claims from 6 to 9, having the form of pellets with a diameter of 2 to 5 mm and a length of 2 to 10 mm.

11. Use of the amorphous porous solid according to any of the previous claims from 1 to 5, or of the composition according to any of the previous claims from 6 to 10, as catalyst or active catalyst carrier in acid-catalyzed industrial processes.

12. Use according to claim 11, in alkylation, isomeriza-

tion processes and in the oligomerization of hydrocarbons.

13. Use according to the previous claim 11 or 12, in processes comprising hydro-dehydrogenation reactions.

14. Use according to claim 13, in hydrocracking, hydroisomerization processes and in the dewaxing of hydrocarbons.

15. A process for the preparation of a porous solid according to any of the previous claims from 1 to 5, comprising the following steps in succession:

(i) preparation of an aqueous mixture comprising a tetra-alkyl ammonium hydroxide, a hydrolyzable aluminum compound, a hydrolyzable silicon compound and an oxygenated compound of phosphorus in the desired proportions, and a sufficient quantity of water to dissolve and hydrolyze said compounds;

(ii) heating of said mixture in an alkaline environment, preferably maintaining the pH at a value greater than 10, and so that there is essentially no exchange of material with the outside, to obtain the formation of a gel;

(iii) drying and calcination of the gel of step (ii) to obtain the desired amorphous porous solid.

16. The process according to claim 15, wherein said aluminum compound is an aluminum trialkoxide comprising from 1 to 10 carbon atoms in each alkoxide residue, said hydrolyzable silicon compound is a silicate of at least one hydrocarbon residue, preferably a tetraalkylorthosilicate, comprising from 1 to 10 carbon atoms for each alkyl residue, and said oxygenated compound of phosphorus is a phosphoric or a phosphonic salt or ester or the corresponding acid.

17. The process according to claim 16, wherein said phosphorus compound is an ammonium salt or an ester of phosphoric or phosphonic acid in which each alkyl residue comprises from 1 to 10 carbon atoms.

18. The process according to any of the claims from 15 to 17, wherein, in step (I), the following atomic or molar ratios are used: Si/Al from 10/1 to 250/1, tetraalkyl ammonium hydroxide/Si from 0.05/1 to 0.2/1, H_2O/Si from 5/1 to 40/1, P/Al from 0.1 to 5.0

19. The process according to any of the claims from 15 to 18, wherein, in step (i), the mixture is heated to a temperature ranging from 30 to 80°C until a limpid solution is obtained.

20. The process according to any of the claims from 15 to 19, wherein, in step (ii), said heating is effected at a pH ranging from 11 to 12 and to a temperature rang-

ing from 60 to 120°C, operating in a closed vessel at autogenous pressure of the system, or at atmospheric pressure with refluxing, for a time ranging from 10 minutes to 3 hours.

21. The process according to any of the claims from 15 to 20, wherein, in step (ii), an alcohol, having from 1 to 10 carbon atoms, preferably ethanol, is added to the mixture up to an alcohol/Si ratio of 8/1.

22. The process according to any of the claims from 15 to 21, comprising an aging step of the gel of 1 to 24 hours at the end of step (ii) and before the drying and calcination step (iii).

23. A process for the preparation of the solid composition according to any of the previous claims from 6 to 10, comprising the formation of a mixture containing from 30 to 99% by weight of the amorphous porous solid according to any of the previous claims from 1 to 5, and from 70 to 1% by weight of an inert inorganic binder.

24. The process according to claim 23, wherein said porous solid is in the form of a humid gel and is mixed with said binder with a weight ratio between binder and gel ranging from 0.05 to 0.5.

25. The process according to one of the previous claims 23 or 24, wherein said mixture also comprises a plasticizing agent selected from methyl cellulose, stearine

and glycerol, preferably methyl cellulose in a quantity ranging from 5 to 20 g per 100 g of binder.

26. The process according to one of the previous claims from 23 to 25, wherein an organic acid is added to said mixture in a quantity ranging from 0.5 to 8 g per 100 g of binder.

27. The process according to one of the previous claims from 23 to 26, wherein said mixture is homogenized by mixing and heating to a temperature ranging from 40 to 90°C, until a paste is obtained, it is then extruded into cylindrical granules having a size of 2-10 mm in length and 0.5-4.0 mm in diameter, and is finally dried and calcined.